

APPENDIX A
"CLEAN" VERSION OF EACH PARAGRAPH/SECTION/CLAIM
37 C.F.R. § 1.121(b)(ii) AND (c)(i)

SPECIFICATION (Amended) Page 5

mixture contained, is loaded into an oven. The oven can either be preheated to some temperature, or ramped to some temperature. Typically temperatures of 60 °C to 120 °C are used. After some time, typically from 1 hour to 24 hours at a temperature sufficient to ensure full cure, the mold is allowed to cool to room temperature. The bolts undone, and one half of the casing is removed to expose a sandwich type structure consisting of backplane, siloxane, and master.

The stamp with affixed backplane is separated from the photoresist/glass master to complete the process.

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A series of sources for severe pattern distortion in this standard process result by virtue of the curing of the siloxane at higher temperatures than the final use temperature (room temperature). One reason for the distortion noted above is that each component of the mold, including the master with glass and photoresist, flexible backplane, spacers, and mold housing expands with temperature changes according to the CTE (Coefficient of Thermal Expansion) of each. Thus, each component of the structure, being made of a different material with a different coefficient of expansion, expands disproportionally relative to each other, and to the original intended pattern. These will be the dimensions in place at the time of curing when the siloxane hardens into a stamp, and the pattern becomes fixed.

At this point, with the oven hot and after sufficient time for curing, the stamp possesses a pattern dimension that is related to the original master pattern according to the composite CTE of the master glass and photoresist. As the glass and photoresist will have expanded more or less uniformly, the stamp pattern will differ from the original in a relatively predictable way, which would be able to be reasonably compensated for by choice of an appropriately scaled master pattern to begin with. This sequence would produce a useful product if this were the end of the fabrication process, but it is not. Before the stamp is separated from the mold, the entire assembly must first be cooled down. During cooling, the master will shrink according to its moderate CTE (maybe 20 to 40 ppm). The stamp itself will shrink very significantly with a CTE of about 500 to 800 ppm, and the affixed backplane will shrink with a CTE of around 5 to 50

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careful investigation where the bulk modulus was measured before and after the post-cure heating indeed showed that the modulus was brought to the same or nearly the same higher value as achieved by curing to that higher temperature right from the start. This finding was confirmed to be repeatable.

Thus, the invention separates the curing of the siloxane (or other material) stamp into two stages. The first stage accomplishes the vast majority of chemical crosslinking while constrained by the master pattern at the intended pattern dimensions.

The second stage hardens the material without inducing significant further permanent geometrical changes to the pattern. Thus, both necessary stamp requirements, which are usually mutually exclusive, are met simultaneously by this method.

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The method of the present invention may be used in manufacturing a common type of liquid crystal display (LCD) flat panel display wherein TFT (Thin Film Transistor-an essential component of active matrix flat panel displays) and wiring dimensions contained therein are microscopically small and the registration of subsequent layers of such display is within microns over many inches.

Thus, while there have been shown, described and pointed out fundamental novel features of the invention as applied to currently preferred embodiments thereof, it will be understood that various omissions and substitutions and changes in the form and details of the method and apparatus illustrated, and in their operation, may be made by those skilled in the art without departing from the spirit of the invention. In addition it is to be understood that the drawings are not necessarily drawn to scale but that they are merely conceptual in nature. It is the intention, therefore, to be limited only as indicated by the scope of the claims appended herewith.

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